

Sustainability Indicators for the Fraser Basin—A Tool for Change

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Abstract

The Fraser Basin Council (Council) has developed a set of indicators to measure the state of sustainability in the Fraser River Basin. Indicators are statistical data that can provide insight into the functioning of a complex system. Sustainability indicators help to describe social, economic, environmental or institutional dimensions of sustainability, as well as the linkages among these dimensions. The Fraser Basin Council's indicators will help advance sustainability by engaging basin residents and stakeholders in developing collaborative actions to address current sustainability trends. The Council developed its indicators by researching indicator initiatives and soliciting expert advice, and through dialogue with government, civil society, the private sector and the general public. An advisory committee assisted with data collection and analysis.

The Council presented its 16 headline indicators in a *Snapshot on Sustainability: State of the Fraser Basin Report* that was released in January 2003 at the State of the Fraser Basin conference. These key indicators are easily understood and reflect issues of broad concern. However, if these indicators are to continue to be a useful tool for change, the availability and quality of indicator data must improve over time. This will require further dialogue and collaboration among many partners interested in, and responsible for, the collection, analysis and dissemination of information about sustainability. Ongoing cooperation, coordination, and networking among indicator practitioners would also strengthen future indicator work.

Fraser Basin Council and the *Charter for Sustainability*

The Fraser Basin Council (Council) is a unique non-governmental, not-for profit organization focused on advancing the sustainability of the Fraser River Basin. The Council brings together the four orders of Canadian government (federal, provincial, local and First Nations) with the private sector and civil society to find common ground and develop solutions to complex sustainability challenges.

The Basin includes the Fraser River and its major tributaries and drains an area of about 238,000 square kilometres, or 25% of British Columbia's (BC) land. It is also home to 2.6 million urban, suburban and rural residents, contributes approximately 80% of BC's economy and is one of the world's largest salmon producing river systems.

The Council has a board of 36 directors, representing four orders of Canadian government, private sector and civil society interests. The Council has been instrumental in resolving complex, inter-jurisdictional sustainability issues where there is no single lead agency responsible. As an impartial, independent and non-political advocate for sustainability in the Basin, the Council convenes and facilitates inclusive, multi-interest processes that use dialogue and collaboration to inform decision making within the Basin. The Council's mandate is two-fold:

- To advance sustainability in the Fraser Basin.
- To measure and report on progress towards sustainability in the Fraser Basin.

As many people have come to realize, the concept of sustainability has many different meanings and definitions. The Council's *Charter for Sustainability* (Fraser Basin Council 1997) describes a broad vision of sustainability where "social well-being is supported by a vibrant economy and sustained by a healthy environment." The charter's definition of sustainability is "living and managing our activities in a way that balances social, economic, environmental and institutional considerations to meet our needs and those of future generations." In addition, the charter includes 12 principles and 26 goals of sustainability.

Some examples of the charter's principles include:

- **Integration**—Consideration of social, economic and environmental costs and benefits must be an integral part of all decision making.
- **Coordinated and Cooperative Efforts**—Coordinated and cooperative efforts are needed among all government and nongovernment interests.
- **Open and Informed Decision-Making**—Open decision making depends on the best available information.

Some examples of the charter's goals include:

- Management of water resources to protect and maintain water quality, support maintenance of ecosystems and provide certainty of access for all users.
- Diversity and abundance of natural species and habitats in the Basin.
- Community well-being to enable residents to meet their economic, social and environmental needs.

Therefore, the *Charter for Sustainability* provides a framework within which the Council, its partners and many others may describe, discuss and ultimately, advance sustainability.

Measuring Sustainability—Developing and Using Indicators

As noted above, the charter is a framework to advance sustainability. But how can we effectively advance sustainability if we don't measure progress toward or away from sustainability objectives over time? If we don't measure, how will we know if things are getting better or worse? How will we know if we are making a difference, or what additional work is needed to further advance sustainability?

An indicator is one tool that may help to measure sustainability. Indicators are statistical data that can provide insight into the functioning of a complex system. Sustainability indicators help to describe social, economic, environmental or institutional dimensions of sustainability, as well as the linkages among these dimensions. Sustainability indicators are used to measure critical trends in progress towards sustainability. They help to identify areas where communities are becoming less or more sustainable, thereby acknowledging where progress is being made, and where change is required. Therefore, a sustainability indicator is one tool that is available to assist in measuring trends and progress over time for a particular issue or theme area. Indicators are not definitive measurements of sustainability; however, they can provide a window into the bigger picture of sustainability. A suite of indicators may begin to provide a more comprehensive look at sustainability as a whole.

Indicators can provide useful information to assist decision making at a variety of levels:

- Communities (e.g., community planning).
- Four Orders of Government (e.g., policies, programs and projects of federal, provincial, First Nations and local governments).
- Nongovernment organizations (e.g., strategic planning).
- Business community (e.g., business planning).
- Civil society (action planning or advocacy).
- General public (e.g., individual actions and consumer behaviour).

In addition, the media and educators may also use indicators to help communicate information and to educate people about a wide variety of issues.

If indicators are to be relevant and understandable for a broad audience, they should be simple, concise and reflective of community values and priorities. If indicators are to be applied effectively, they should be linked with communication and action. It is important to communicate the indicator trends in a variety of ways including hard copy and electronic reports, web-based information and presentations, as well as through the media.

Sustainability Indicators for the Fraser Basin—Process

Between 2000 and 2002, the Council undertook an extensive consultative and collaborative process to assist in the development of sustainability indicators for the Fraser Basin. Initial dialogue with practitioners and a literature review of indicator initiatives assisted in identifying issues and indicators that were commonly used by others. This information was published in the format of a workbook entitled *Sustainability Indicators for the Fraser Basin: Workbook* (Fraser Basin Council 2000). The workbook served as an important basis for substantial public and stakeholder consultation, and included a survey to solicit feedback about priority sustainability issues within the Basin and preferred indicators to help assess the current state of those issues and to measure trends.

The workbook was released at the Council's State of the Fraser Basin Conference in November 2000. In addition, eight regional workshops were held in communities throughout all regions of the Basin to engage people in face-to-face dialogue. About 300 participants representing a wide variety of perspectives participated in the eight regional workshops. In addition, the Council received about 400 respondents to its indicator survey. The results of the survey, the regional workshops and other consultation meetings were consolidated within a report entitled *Sustainability Indicators for the Fraser Basin: Consultation Report* (Fraser Basin Council 2001). This consultation process was vital to ensure that the

indicators selected by the Council were reflective of the values, concerns and priorities of the people living within and responsible for the Fraser Basin.

Following considerable public and stakeholder consultation, the Council initiated a more detailed technical review and analysis. A technical advisory committee was established including practitioners from about 20 different organizations with a wide variety of expertise in sustainability and indicators. The advisory committee played a vital role in locating and analyzing the best available information and identifying which specific indicator options would be most suitable for reporting on sustainability trends in the Basin. The advisory committee was also extremely helpful in bringing diverse perspectives to the analysis of data trends and in telling a balanced sustainability story.

The final step in the first phase of the Council's indicator process was the actual production of the sustainability report. This involved substantial writing, editorial review, graphic design and layout, and ultimately printing and distribution of the report entitled *Snapshot on Sustainability: State of the Fraser Basin Report* (Fraser Basin Council 2003). The report was released on January 24 at the 2003 State of the Fraser Basin Conference. It was also distributed to about 3,500 contacts on the Council's mailing list database and many others upon request.

Snapshot on Sustainability: State of the Fraser Basin Report

The *Snapshot on Sustainability* profiles 16 different sustainability issues including social, environmental and economic dimensions of sustainability. In most cases, data have been collected for several indicators within each issue or theme. For each sustainability issue, the report profiles several key points or highlights. A graphical icon in the form of a speedometer or gasoline gauge illustrates the direction of the trend for a given indicator for a particular period of time (i.e., getting better, getting worse, uncertain). There are two sources of uncertainty with respect to the indicator trends. In some cases, the trend itself is uncertain. For example, the Council was unable to acquire sufficient information regarding aboriginal treaties, protocols and agreements to support an analysis of trends in this area. Alternatively, in the area of population, there is sufficient data to determine a trend regarding population growth and decline throughout the Fraser Basin. However, the sustainability implications of these population trends are uncertain. Following a quick synopsis of key highlights for each sustainability issue, the report poses and attempts to answer the following questions:

- Why is this important for sustainability?
- What are the trends and current conditions?
- What can be done?
- What are some future information needs?
- Where can I learn more?

This organization of content is intended to inform the reader about the issues and trends within the context of sustainability. The report also provides a few simple suggestions about actions that can be taken to help advance sustainability. Examples of actions are provided for individuals, businesses, governments and communities as a whole. The report also acknowledges that there are some additional information needs if we are to better understand sustainability. Therefore the limitations of the "best available information" are made explicit, with recommendations made regarding potential priorities for future monitoring and research. Finally, readers are referred to additional resources for more information within a given topic area.

Table 1. Sustainability Issues and Indicators for the Fraser Basin.

Issue / Theme / Topic	Sustainability Indicator
Population	Population Growth / Decline Demographic Changes Growth Management
Health	Life Expectancy Leading Causes of Death Rate of Low Birth Weight
Education	Education Levels Attained Teacher : Pupil Ratios Apprenticeship Training
Housing	Core Housing Need Growth Management Rates of Home Ownership vs. Rental Housing Rental Housing Vacancy and Rental Rates
Community Engagement	Volunteerism Voter Turnout Charitable Donations
Aboriginal and Non-Aboriginal Relationships	Treaties, Protocols and Agreements Aboriginal Populations, Communities & Culture
Water Quality	Water Quality Trends Boil Water Advisories Waterborne Disease Outbreaks Groundwater
Air Quality	Particulate Matter (PM10) Smog and Other Air Pollutants
Fish and Wildlife	Status of Fraser River Salmon Stocks Fish and Wildlife Species at Risk Protected Areas and Resource Management Planning
Income and Employment	Employment and Unemployment Rates Average Household Income Proportion of Low Income Families
Economic Diversification	Employment Diversification BC Economic Index
Corporate Social Responsibility	CSR Criteria by the Forest Sector CSR Criteria by the Other Sectors
Forests and Forestry	Forest Cover (leading species and age class distribution) Sustainable Forest Management Certification Sustainable Resource Management Plans Forest Pests
Agriculture	Area in Agricultural Production Agricultural Land Reserve Net Farm Income Farm Environmental Management Practices
Energy	Energy Consumption Residential Energy Consumption Greenhouse Gas Emissions Climate Change Impacts
Fraser River Flooding	Population Vulnerable to Flooding Flood Management Policies and Best Practices

The following list includes some highlights of the status of indicator trends within the Fraser Basin for a specified time period.

Table 2. Status of Sustainability Trends in the Fraser Basin.

Topic	Indicator	Status of Trends	Time Period
Population	Pop'n. Growth / Decline	Uncertain Implications	1981 – 2001
	Growth Management	Getting Better	1990 – 2002
Health	Life Expectancy	Getting Better	1991 – 2001
	Leading Causes of Death	Better and Worse	1991 – 1999
Education	Education Levels Attained	Getting Better	1981 – 1996
Housing	Core Housing Need	Getting Worse	1991 – 1996
Community Engagement	Volunteerism	Getting Worse	1997 – 2000
	Voter Turnout	Getting Worse	1997 – 2000
Aboriginal and Non-Aboriginal Relationships	Treaties, Protocols and Agreements	Uncertain Trends	1990 – 2002
Water Quality	Water Quality Trends	Getting Better	1985 – 1995
	Boil Water Advisories	Getting Worse	1995 – 2002
Air Quality	Particulate Matter (PM10)	Getting Better	1994 – 2000
	Smog and Other Air Pollutants	Getting Worse	
Fish and Wildlife	Fraser River Salmon Stocks	Better and Worse	Historic record 1997 – 2002
	Species at Risk	Uncertain Trends	
Income and Employment	Average Household Income	Getting Better	1981 – 1996
	Proportion of Low Income Families	Getting Worse	1981 – 1996
Economic Diversification	Diverse Employment Distribution	Uncertain Trends and Implications	1981 – 1996
Corporate Social Responsibility	CSR Criteria in Forest Sector	Getting Better	Current
	CSR Criteria in Other Sectors	Uncertain Trends	Current
Forests and Forestry	Forest Cover	Uncertain Trends	Current
	Sustainable Forest Management	Getting Better	1999 – 2002
Agriculture	Area in Agricultural Production	Uncertain Implications	1986 – 1996
	Farm Economies	Getting Better	1986 – 1996
Energy	Energy Consumption	Getting Worse	1981 – 1999
	Greenhouse Gas Emissions	Getting Worse	1990 – 2000
Fraser River Flooding	Population Vulnerable	Getting Worse	1981 – 2001
	Flood Management	Better and Worse	Current

Using the Sustainability Report

The Council anticipates that the sustainability report will be used in a variety of ways. First and foremost, the Council will use the report in fulfillment of its mandate to monitor progress toward sustainability within the Fraser Basin. By reporting on key sustainability trends, the report also serves to increase information, education and awareness about sustainability across a broad constituency of residents and decision-makers. By reviewing and analyzing the best available information with which to support indicator development, the report also serves to identify information gaps and potential research priorities.

The sustainability report includes a fairly comprehensive look at the big picture of sustainability within the Fraser Basin. It can therefore be used as a catalyst to promote and encourage further dialogue on a wide variety of sustainability issues and trends. For example, a municipal council could use the report as a basis to discuss and explore in detail some of their local sustainability challenges and concerns. The report may also provide a context for groups or communities to set common priorities and build partnerships in order to collectively address those priorities. It is anticipated that the report may provide some benefit in support of land use planning and strategic planning processes. The indicator trends may also assist in the analysis and development of government policies and programs. Ultimately, it is the intention of the report to inspire a wide variety of actions at all levels that collectively will help to advance sustainability in the Fraser Basin. Individuals in their day-to-day behaviour may undertake some actions, while other actions may relate to broader

institutional changes such as policies, programs and management practices. As the report was only released in January 2003, it is too early to assess the effectiveness of the report in fulfilling this wide range of possible functions.

Next Steps for the Fraser Basin Council

The Council has positioned the sustainability report in the context of a larger, long-term process of reporting on sustainability in the Fraser Basin. The immediate priority for the Council is to continue to communicate the findings of the report to a wide audience through many different mechanisms. In addition to reporting on the findings of this initiative, the Council is committed to reviewing and integrating feedback to refine and enhance the next sustainability report, which is scheduled for release at the next State of the Fraser Basin Conference in November 2004. The Council will establish an enhanced advisory process to support its ongoing work to develop and report on sustainability indicators. This will involve continued dialogue and collaboration to develop better indicators and acquire better data. Some enhancements that are under consideration for the next report include obtaining and using more up-to-date data, developing new indicators and providing additional trend analysis on a regional scale.

Conclusions and Lessons Learned

Producing the *Snapshot on Sustainability* has been both a challenging and rewarding initiative for the Council. The report has established a solid foundation and a baseline from which to build upon in future years as the Council continues to fulfill its mandate to report on the state of sustainability in the Fraser Basin. There are several lessons learned regarding the state of sustainability in the Fraser Basin as well as the practice of developing and applying sustainability indicators. The following are some highlights of observations and insights from the project.

Report Findings

Regarding the report findings, several conclusions may be made. Overall, the Fraser Basin and its many communities are doing fairly well with respect to sustainability. Many of the trends for specific issues are getting better. For example, basin residents are achieving increasingly higher levels of education. Water quality in many lakes and rivers is improving. About half of all Fraser River salmon stocks have increased in the past decade when compared with historic records. However, there is also room for improvement in relation to some sustainability trends. For example, there has been a substantial increase (168%) in the number of people living within the floodplain of the lower Fraser River, and thus, many more people are at risk from a major flood. About one in ten species in the Basin is “red-listed” or considered to be at risk of extinction. Community engagement has declined in recent years as expressed in rates of volunteerism, charitable giving and voter turnout. Therefore, the *Snapshot on Sustainability* includes a mix of good news and bad news for the Fraser Basin. It should also be noted that in some cases, regional sustainability trends might differ from the basin-wide trends. For example, total population in the Fraser Basin is growing. However, most of this growth is occurring in the Lower Mainland, while some communities in rural regions are experiencing little growth, or perhaps even population decline.

Diverse Stories of Sustainability

It is clear from this project that depending on individual perspectives and local circumstances, there are many unique stories of sustainability. This is reflected in the priority issues of Basin residents (i.e., what issues are important to measure?), the preferred indicators (i.e., what indicators provide the best measures?), and the appropriate responses (i.e., what should be done for a more sustainable Basin?). The diversity of sustainability stories is driven, in part, by unique local or regional circumstances. In addition, different levels of government and different departments or ministries each have their own priorities and jurisdictions related to a diverse range of sustainability issues. It is evident that there are different human, financial and information resources available, as well as different information needs at different geographical scales. Senior governments, First Nations, local governments, businesses and individual citizens each have their own priority sustainability issues and information needs. Despite these varied priorities and needs, the Council believes that indicators, if selected carefully and if monitored and adapted over time, can provide useful information in support of these diverse needs.

Set Realistic Expectations

The complexity of sustainability issues and the infinite challenges associated with compiling and analyzing data suggest the importance of setting realistic expectations. It is important to be realistic about what indicators are and are not. For example, indicators are measurement tools based on samples of data. Indicators are not solutions to sustainability problems. It is important to be realistic about what can be achieved in the short-term versus the long-term. The Council is committed to developing and refining its sustainability indicators over the long-term; however, the first report was necessarily based on existing information and databases. Although new information may be developed over time, this was not practical for the first phase of the Council’s indicator initiative. It is also important to be realistic about

the limitations of the various indicator data and the ability to analyze indicator trends. Some of these limitations include information gaps, uncertainties or inconsistencies regarding data quality, misalignment of natural boundaries and administrative/jurisdictional boundaries, availability of data over a consistent time series, and aggregation / disaggregation of data at a variety of geographic scales. Each of these limitations must be considered and addressed by indicator initiatives.

Design an Appropriate Process

It has been suggested by many that the process of indicator development may be as important as the final product or indicator report. This is because of the shared learning that occurs within a process and because of the collaborative working relations that often form. Each indicator initiative will likely require its own appropriate process due to the unique characteristics being measured in each region and the collective wisdom of the participants involved. An indicator process will benefit from diverse participation and consultation at all stages throughout the process. A diversity of perspectives can be invaluable during the identification of critical issues of sustainability, the selection of meaningful indicators and the analysis of the trends themselves. By involving many different people with varying levels of expertise throughout the process, a more complete and relevant story of sustainability is more likely to emerge. If an indicator process is to have long-term influence, then it is critical that the lead organization or partnership be committed to a long-term process for continued reporting on trends over time and to allow for the integration of feedback. A long-term commitment also allows for an evolution of indicators as new sustainability issues, challenges and priorities emerge.

Find the Right Balance

Perhaps one of the most important challenges for indicator initiatives is to find the right balance of indicators. There are many seemingly competing objectives when it comes to the development and use of indicators. Therefore the project proponent must find a healthy balance that is informed by its constituents or target audiences. For example, most indicator initiatives are faced with competing objectives regarding comprehensiveness and conciseness. Sustainability is a complex, all-encompassing concept with many inter-connections. Therefore, sustainability indicators require a relatively comprehensive look at a wide variety of issues and the linkages among them. However, if indicator reports are to be read and acted on, there is also a need to publish relatively concise, easy-to-read reports. There is also a need to find the right balance among social, economic and environmental indicators of sustainability. By including all dimensions and the linkages among them, a more integrated picture of sustainability is presented and a wider diversity of human needs, values and aspirations is included. Therefore a sustainability report is more likely to appeal to a broad audience with varied interests when compared with a more narrowly focused environment or economic report. Finally, there is a need to balance technical merit with public interest and acceptance. It is important that the indicator data are collected and analyzed in a way that is scientifically defensible and based on the best available information. However, it is also important that the information be presented in a way that is appealing and of interest to a public audience.

Conclusion

In conclusion, only time will tell if sustainability indicators are truly an effective tool to help advance sustainability. Based on the experience of the Council over the past two years, it is believed that sustainability indicators, if monitored and adapted over time, can provide a useful tool to inform decision making at many scales. There are many challenges and pitfalls to be aware of and there are many opportunities to be pursued. By basing an indicator initiative on the priority concerns of the public and by applying the insight and analysis of expert practitioners, it is likely that indicators can inform a wide range of decisions, from individual behaviour to policy analysis to program implementation. Indicators can help people to understand the complex inter-relations between seemingly distinct sustainability issues such as economic growth, energy consumption and air quality. By involving and engaging numerous individuals, organizations and perspectives in an indicator process, there are many opportunities to learn, build capacity and develop collaborative working relationships. The formation of these strong working relationships within an indicator project may contribute to a strong foundation from which collaborative actions may be taken to advance sustainability.

References

Fraser Basin Council, 1997. *Charter for Sustainability*. Fraser Basin Council. Vancouver, British Columbia.

Fraser Basin Council, 2000. *Sustainability Indicators for the Fraser Basin: Workbook*. Fraser Basin Council. Vancouver, British Columbia.

Fraser Basin Council, 2001. *Sustainability Indicators for the Fraser Basin: Consultation Report*. Fraser Basin Council. Vancouver, British Columbia.

Fraser Basin Council, 2003. *Snapshot on Sustainability: State of the Fraser Basin Report*. Fraser Basin Council. Vancouver, British Columbia.